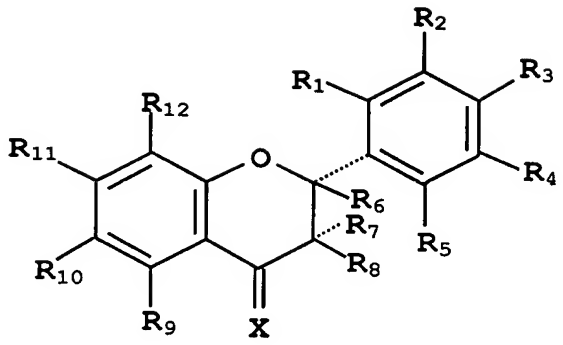
CLAIMS

What is claimed is:

1. A compound of the formula:



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Wherein,

X is selected from O and S; and

i) when X is O,

R_1, R_4, R_5 and R_8 are H or F;

R_6 and R_7 combine to form a double bond;

R_2 and R_3 are selected from H, OH, SH, Halogen, Alkyl, Amino, HNMe, Cyano, Carboxyl, Carboxyalkyl, Carboxamide, alkoxycarbonyl, O-Hydroxyalkyl, CF_3, O-Alkyl, O-SO_3H, O-SO_2H, O-PO_3H, O-Glycoside, O-Glucoronide and O-Amino Acid, including O-CO-A-(CH_2)n-NR'R", where A is Phenyl, substituted phenyl or absent; n is 0 through 5; R' and R" are selected from H, lower alkyl, hydroxyalkyl, aminoalkyl, mono and dialkylaminoalkyl, carboxyalkyl or R' and R" may combine to form a cyclic ring, optionally substituted with a O, S, NH or N-Alkyl and the methylene adjacent to the nitrogen may be optionally substituted with a amino alkyl,

carboxy or carboxyalkyl group and O-CO-NH-(CH_2)m-CH-(NH_2)COOH, where m is 1 through 4 ; and when R_2 and R_3 are OH, SH or Amino, they may be optionally combined through a methylene or carbonyl group;

R_9 is selected from OH, Amino, NHMe, SH, or SMe; and

R_{10} and R_{11} or R_{11} and R_{12} are methylenedioxy (O-CH_2-O), or a cyclic carbonate (O-CO-O), or R_{12} is H and R_{10} , R_{11}, are selected from H, OH, Halogen such as F or Cl, Alkyl, Amino, Cyano, Carboxyl, Carboxyalkyl, Carboxamide, alkoxycarbonyl, O-Hydroxyalkyl, CF_3, O-Alkyl, O-SO_3H, O-SO_2H, O-PO_3H, O-Glycoside, O-Glucoronide and O-Amino Acid, including O-CO-A-(CH_2)n-NR'R", where A is Phenyl, substituted phenyl or absent; n is 0 through 5; R' and R" are selected from H, lower alkyl, hydroxyalkyl, aminoalkyl, mono and dialkylaminoalkyl, carboxyalkyl or R' and R" may combine to form a cyclic ring, optionally substituted with a O, S, NH or N-Alkyl and the methylene adjacent to the nitrogen may be optionally substituted with a amino alkyl, carboxy or carboxyalkyl group and O-CO-NH-(CH_2)m-CH-(NH_2)COOH, where m is 1 through 4; with the proviso that when R_2 and/or R_3 are H, OH, OMe, Cl, or Amino then R_9, R_{10}, and R_{11} are not the same.

ii) when X is S,

R_1 through R_5 and R_9 through R_{12} are selected from H, OH, Halogen such as F or Cl, SH, SMe, Alkyl, Amino, NHMe, Cyano, Carboxyl, Carboxyalkyl, Carboxamide, alkoxycarbonyl, O-Hydroxyalkyl, CF_3, O-Alkyl, O-SO_3H, O-SO_2H, O-PO_3H, O-Glycoside, O-Glucoronide and O-Amino Acid, including O-CO-A-(CH_2)n-NR'R", wherein A is phenyl, substituted phenyl or absent; wherein n is 0 through 5, wherein R' and R" are selected from H, lower alkyl, hydroxyalkyl, aminoalkyl, mono and dialkylaminoalkyl, carboxyalkyl or wherein R' and R" combine to form a

cyclic ring, said cyclic ring being optionally substituted with a O, S, NH or N-Alkyl and wherein the methylene adjacent to the nitrogen may be optionally substituted with a amino alkyl, carboxy or carboxyalkyl group and O-CO-NH-(CH_2)m-CH-(NH_2)COOH wherein m is 1 through 4;

R_6 and R_7 combine to form a double bond;

R_8 is selected from H or F; and,

when R_1 through R_5 and R_9 through R_{12} are OH and/or amino, and are present on adjacent ring carbons then they may be combined through a methylene (-O-CH_2-O-) or a carbonyl (-O-CO-O-, –O-CO-NH- or S-CO-NH-) group to form a cyclic ring.

2. A compound according to Claim 1 wherein R10 and R12 are OH.

3. A compound according to Claim 1 wherein the compound is5-Hydroxy-3', 4', 7-tricarboxymethyloxyflavone.

4. A compound according to Claim 1 wherein the compound is 6,7 Methylenedioxy-3', 4', 5-trihydroxyflavone.

5. A compound according to Claim 1 wherein the compound is 7,8 Methylenedioxy-3', 4', 5-trihydroxyflavone.

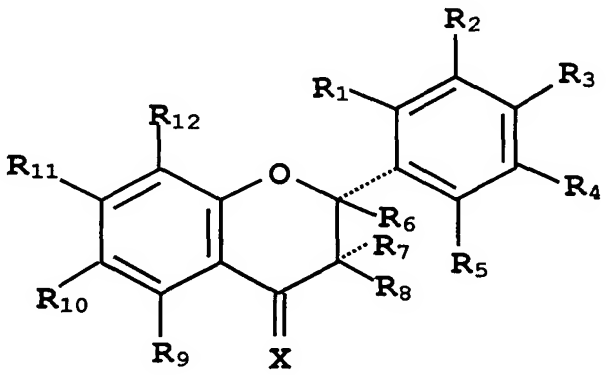
6. A compound according to Claim 1 wherein the compound is 6,7-Carbonyloxy-3', 4', 5- trihydroxyflavone.

7. A compound according to Claim 1 wherein the compound is3',4'-Carbonyloxy-5,7-dihydroxyflavone.

8. A compound according to Claim 1 wherein the compound is 3', 5,7-Trihydroxyflavone-4'-phosphate.

9. A compound according to Claim 1 wherein the compound is 3', 5, 7-Trihdroxy -4'-(2-amino-1- carboxypropyloxy) flavone.

10. A method for inhibiting T-lymphocyte activativity in a human or veterinary patient, said method comprising the step of administering to the patient, in an amount that is effective to inhibit T-lymphocyte activity, a compound having the formula:



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Wherein,

X is selected from O and S;

R1 through R5 and R9 through R12 are selected from H, OH, SH, Sme, Halogen, Alkyl, Amino, Cyano, Carboxyl, Carboxyalkyl, Carboxamide, alkoxycarbonyl, O-Hydroxyalkyl, CF3, O-Alkyl, O-SO3H, O-SO2H, O-PO3H, O-Glycoside, O-Glucoronide and O-Amino Acid, including O-CO-A-(CH2)n-NR'R", where A is

Phenyl, substituted phenyl or absent; n is 0 through 5; R' and R" are selected from H, lower alkyl, hydroxyalkyl, aminoalkyl, mono and dialkylaminoalkyl, carboxyalkyl or R' and R" may combine to form a cyclic ring, optionally substituted with a O, S, NH or N-Alkyl and the methylene adjacent to the nitrogen may be optionally substituted with a amino alkyl, carboxy or carboxyalkyl group and O-CO-NH-(CH2)m-CH-(NH2)COOH, where m is 1 through 4;

R6 and R7 are H or may combine to form a doublebond;

R8 is selected from H, Halogen, Alkyl, Amino, Cyano, Carboxyl, Carboxyalkyl, Carboxamide, alkoxycarbonyl and CF3. Furthermore, when R1 through R5 and R9 through R12 are OH, SH or amino and are present on adjacent ring carbons then they may be combined through a methylene (-O-CH2-O-) or a carbonyl (-O-CO-O-, -O-CO-NH- or –S-CO-NH-) group to form a cyclic ring. Most preferred are 6,7 and 7,8-methylenedeoxy and 3',4'-carbonyloxy (cyclic carbonate) derivatives.

11. A method according to Claim 10 wherein the method is carried out for the purpose of treating diabetes or stabilizing the patient's blood glucose levels and wherein the compound is not luteolinthe 5 glucoside of luteolin, the 7 glucoside of luteolin,or apigenin.

12. A method according to Claim 10 wherein the method is carried out for the purpose of treating Amyotrophic Lateral Sclerosis and wherein the compound is not luteolin, genistein, or daidzein.

13. A method according to Claim 10 wherein the method is carried out for the purpose of treating Amyotrophic Lateral Sclerosis and wherein the method comprises the step of administering a compound of the formula set forth in Claim 10 in combination with another compound.

Phenyl, substituted phenyl or absent; n is 0 through 5; R' and R" are selected from H, lower alkyl, hydroxyalkyl, aminoalkyl, mono and dialkylaminoalkyl, carboxyalkyl or R' and R" may combine to form a cyclic ring, optionally substituted with a O, S, NH or N-Alkyl and the methylene adjacent to the nitrogen may be optionally substituted with a amino alkyl, carboxy or carboxyalkyl group and O-CO-NH-(CH2)m-CH-(NH2)COOH, where m is 1 through 4;

R6 and R7 are H or may combine to form a doublebond;

R8 is selected from H, Halogen, Alkyl, Amino, Cyano, Carboxyl, Carboxyalkyl, Carboxamide, alkoxycarbonyl and CF3. Furthermore, when R1 through R5 and R9 through R12 are OH, SH or amino and are present on adjacent ring carbons then they may be combined through a methylene (-O-CH2-O-) or a carbonyl (-O-CO-O-, -O-CO-NH- or –S-CO-NH-) group to form a cyclic ring. Most preferred are 6,7 and 7,8-methylenedeoxy and 3',4'-carbonyloxy (cyclic carbonate) derivatives.

11. A method according to Claim 10 wherein the method is carried out for the purpose of treating diabetes or stabilizing the patient's blood glucose levels and wherein the compound is not luteolinthe 5 glucoside of luteolin, the 7 glucoside of luteolin,or apigenin.

12. A method according to Claim 10 wherein the method is carried out for the purpose of treating Amyotrophic Lateral Sclerosis and wherein the compound is not luteolin, genistein, or daidzein.

13. A method according to Claim 10 wherein the method is carried out for the purpose of treating Amyotrophic Lateral Sclerosis and wherein the method comprises the step of administering a compound of the formula set forth in Claim 10 in combination with another compound.

14. A method according to Claim 10 wherein the compound is administered in combination with Rutin, a congener of Rutin or derivative of Rutin.

15. A method according to Claim 14 wherein a) the compound of Claim 10 and b) the Rutin, congener of Rutin or derivative of Rutin are administered in a weight ration of about 50%/50%.

16. A method according to Claim 14 wherein a) the compound of Claim 10 and b) the Rutin, congener of Rutin or derivative of Rutin are administered in a weight ration of about 75%/25%.

17. A method according to Claim 14 wherein a) the compound of Claim 10 and b) the Rutin, congener of Rutin or derivative of Rutin are administered in a weight ration of about 50%/50% to about 75%/25%.

18. A method according to Claim 10 wherein the compound of Claim 10 undergoes first pass metabolism when absorbed through the gastric and/or intestinal mucosa and wherein the compound of Claim 10 is administered so as to be substantially absorbed by a route other than through the gastric and/or intestinal mucosa.

19. A method according to Claim 18 wherein the compound is administered so as to be substantially absorbed via the patient's sublingual mucosa.

20. A method according to Claim 18 wherein the compound is administered so as to be substantially absorbed via the patient's buccal mucosa.

21. A method according to Claim 18 wherein the compound is administered so as to be substantially absorbed via the patient's rectal mucosa.

22. A method according to Claim 18 wherein the compound is administered so as to be substantially absorbed via the patient's nasal mucosa.

23. A method according to Claim 18 wherein the compound is administered so as to be substantially absorbed via the patient's sublingual mucosa.

24. A method according to Claim 18 wherein the compound administered so as to be substantially absorbed through the patient's skin.

25. A method according to Claim 18 wherein the compound is administered by injection.

26. A method according to Claim 10 wherein R10 and R12 are OH.

27. A method according to Claim 10 wherein the compound is 6,7 Methylenedioxy-3', 4', 5-trihydroxyflavone.

28. A method according to Claim 10 wherein the compound is7,8 Methylenedioxy-3', 4', 5-trihydroxyflavone.

29. A method according to Claim 10 wherein the compound is 6,7-Carbonyloxy-3', 4', 5- trihydroxyflavone.

30. A method according to Claim 10 wherein the compound is 3',4'-Carbonyloxy-5,7-dihydroxyflavone.

31. A method according to Claim 10 wherein the compound is 3', 5,7-Trihydroxyflavone-4'-phosphate.

32. A method according to Claim 10 wherein the compound is 3', 5, 7-Trihdroxy -4'-(2-amino-1- carboxypropyloxy) flavone.

33. A method according to Claim 10 wherein the compound is 5-Hydroxy-3', 4', 7-tricarboxymethyloxyflavone.

34. A method according to Claim 10 wherein the compound is luteolin.

35. A method according to Claim 10 wherein the compound is luteolin and wherein the method further comprises administering to the patient rutin, a rutin congener or a rutin analong in an amount that is effective to enhance the efficacy or duration of action of the luteolin.

36. A method according to Claim 10 wherein the compound is administered in combination with genistein (5,7-Dihydroxy-3-(4-hydroxyphenyl)--4H-1benzopyran-4-one or 4', 5, 7-trihydroxyisoflavone).

37. A method according to Claim 10 wherein the compound is administered in combination with daidzein (7-Hydroxy-3-(4-hydroxyphenyl)-4H-1benzopyran-4-one OR 4', 7-dihydroxyisoflavone).